

Research Article

Biology of Incidental Catch Sea Star *Stellaster childreni* Gray, 1840 (Echinodermata: Asteroidea), from Malaysian Borneo Exclusive Economic Zone

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Sea star (class Asteroidea, phylum Echinodermata) is one of the most successful marine organisms inhabiting a wide range of habitats. As one of the key stone species, sea stars are responsible for maintaining much of the local diversity of species within certain communities. Malaysian Exclusive Economic Zone (EEZ) Resource Survey had been carried out from 16th Aug to 6th Nov 2015 and one of the invertebrate by-catch organisms is sea star *Stellaster childreni* Gray, 1840. This study documents morphological characters and diet of the sea star, besides providing brief descriptions of the habitats based on particle size analysis and vessel log data sheet. A total of 217 individuals had been examined throughout this study. Fragments of flora and fauna were found in the gut including Mollusca (gastropod, bivalves, and scaphopods), sponge seagrass, and seaweed as well as benthic Foraminifera. *Stellaster childreni* were found at depth of 45 m to 185 m in the South China Sea off Sarawak Malaysia, with various sea bottom substrata. Approximately 41% of *S. childreni* were found at a mixture of sandy and muddy substratum, followed by mixture of sandy and coral (19.3%), muddy substratum (17.5%), coral substratum (11.5%), and sandy areas (10.6%). The widely distributed sea star on different types of sea beds suggested healthy deep sea ecosystem; thus Malaysia should explore further potential fisheries resources in the EEZ off Sarawak coast.

1. Introduction

Class Asteroidea, star fish or sea star, is a marine invertebrate that occurs from intertidal to abyssal deep sea area of approximately 6000 m depth [1], which comprises approximately 1900 extant species classified into 36 families and nearly 370 extant genera. Asteroidea serve as “keystone species” due to their predatory nature such as *Pisaster* that interacts with *Mytilus* along the coast of North America [2] which had been documented as determining factors of distribution pattern, abundance, and density of marine organisms [3, 4], thus serving as model organisms in relation to fields of community structure [5] and feeding ecology [6]. Furthermore, in evolutionary developmental biology (Evo-devo), Asteroidea received much attention as debates continue for its complex phylogenetic classifications [1].

For Malaysia, documentation on Asteroidea species inhabiting reef areas is available from South China Sea [7], including Archipelago of Beting Patinggi Ali to Pulau

Layang-Layang, South China Sea [8], Pulau Sipadan, and Bodgaya [9]. In addition, check lists of Asteroidea from seagrass area in the southern Peninsular Malaysia are also made available by [10]. Documentation on sea stars in neighbouring Singapore had been reported by [11]. Meanwhile, [12] had produced brief documentation on sea stars composition inhabiting deep sea of Malaysian EEZ off Sarawak coast.

The implementation of the EEZ of Malaysia in 1981 had led to the extension of the fishing ground beyond the traditional fishing area. The total EEZ area of Malaysia is 548,800 km², and Sarawak, one of Malaysian states located in Borneo Island, has around 160,000 km² Malaysian EEZ [13].

Since the 1980s, surveys on fisheries resources in Malaysian EEZ are being carried out by the Department of Fisheries, Malaysia (DoF M) for every 5 or 10 years, depending on budget availability and the current needs of assessing resources to formulate sustainable harvesting. In 2015, DoF M had conducted fisheries resource survey in EEZ off Sarawak coast, using MV SEAFDEC 2 (owned by South